

Notice of Allowability

Application No.

09/936,023

Examiner

N. Bhat

Applicant(s)

KIM ET AL.

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the filing date of 1-22-2002.
2. ☒ The allowed claim(s) is/are 1-4.
3. ☒ The drawings filed on 1-22-2002 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 3-25-2002
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

1. The following is an examiner's statement of reasons for allowance:

A fluidized bed reduction reactor having a plurality of fluidized bed reactors each with a gas distributor while receiving a reducing gas from a melter gasifier, the fluid bed reactor comprising an iron ore charging duct passing through the top of the fluidized bed react with a free end, the free end of the iron ore charging duct being positioned close to the center of the gas distributor; a spiral shaped partition weir placed over the gas distributor, the partition weir surrounding the iron ore charging duct while being spirally extended from the iron ore charging duct to an inner wall of the fluidized bed reactor, the partition weir being fixed to the inner wall of the fluidized bed. The spiral shape partition weir placed over the gas distributor as claimed prevents back mixing of the reacted iron ore with the unreacted iron ore and has not been taught either singularly or in combination by the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Haight teaches a process and apparatus for separating particles by relative density, which includes concentric annular rings, which imparts a gyratory movement of the particles. Villarreal-Trevino is the closes prior art to applicant's apparatus teaching a fluidized bed reduction for iron ore reduction but does not teach or

suggest using a spiral shaped partition weir placed over the gas distributor which surrounds the partition weir placed iron ore charging duct while being spirally extended from the iron charging duct to an inner wall of the fluidized bed. Perry et al. teach a fluids mixing and distributing apparatus, which includes a pair of continuous vertical spiral weirs, provided on the surface of a collector tray to add residence time to the liquid on the tray for mixing the liquid thereon. The spiral weir is used in a gas-liquid reactor on a collector tray, there is no suggestion in the art to use the spiral weir in a fluidized bed for use of solid particles especially in a fluidized bed reduction reactor for iron ore reduction as claimed. D'Acierno et al. teach a fluid bed reactor having a grid baffle structure which includes theoretical stages within the reactor the baffle structure is disposed within the reactor and include vertical members extending across the reactor, the spiral weir shape has not been taught or fairly suggested. Bresser et al. teach a process for the heat treatment of fine-grained iron ore for the conversion of the heat-treated iron ore into metallic iron using a fluidized bed reactor and cyclone. There is no suggestion in Bresser et al. which teaches using a spiral shaped partition weir placed over the gas distributor as claimed in the instant invention.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Bhat whose telephone number is 571-272-1397. The examiner can normally be reached on Monday-Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


N. Bhat
Primary Examiner
Art Unit 1764